



# Improving Higher Education Through Mobile Technology

Mobile Computing  
in Higher Education



“Computer literacy is today what the three Rs were just a half century ago—an absolute necessity if our graduates are to make their way in the competitive workforce and society of the 21st century.”

*—Dr. Dolores Cross, President, Morris-Brown College*



# Notebooks:

## A Smart Investment in Your College's Future.

*"We are a worldwide university, with students working together in different countries. They can now interact with other students from as far away as Japan. This would not be possible without the use of technology and laptop computers."*

—Francisco Camargo, Director of Information Technology, Monterrey Tech, Mexico

Without question, technology has transformed the way we communicate. The Internet and wireless advances are expanding not only what we can access, but when and how. Preparing students to manage and maximize the world of technology is becoming a high priority for education systems worldwide. But what exactly are the benefits of mobile computing to education? And how do you harness the power of today's technology, put it to work for students today, and do it at a cost that already-strained education budgets can afford?

The truth is, a mobile computing program can help your college or university not only improve education, but revolutionize it, while helping you reduce your Total Cost of Ownership as well. For instance, students can access worldwide resources over the Internet anywhere, anytime. Faculty can enhance their class lectures with multimedia resources and easily communicate with students outside of office hours. And administrators can streamline paper processes and reduce overhead, while ensuring that their IT department invests in technologies that offer long-term rewards.

In the following pages, you'll find various ways that students, faculty and staff are unleashing the power of notebooks on campus. Come. Learn. And prepare for your future.

### Are You Ready for the Future?

- Can faculty, students and staff in your institution communicate and collaborate in real time, anytime?
- Are the next generation of leaders prepared to take advantage of the next generation technology?
- Is your institution ready to deliver the technology students and faculty demand?
- Does your college or university's administrative staff and IT department have the tools to effectively support today's fast-paced learning environment?

### Notebooks Give Everyone in Education a Competitive Edge:

- Attract and retain more of the best teachers
- Attract more of the best students
- Prepare students for the 21st-century work environment
- Make more cost-effective investments in your IT infrastructure

\*\*Wireless internet access may require additional hardware, software and/or services that are sold separately from a Mobile Intel® Pentium® 4 Processor - M based notebook computer.



# Changing the Way Teachers Teach and Students Learn.

Today's notebook computers are taking education far beyond the traditional classroom in terms of time, place and content. The role of the teacher is shifting from one of "director of learning" to "facilitator of learning." And teachers can now direct students in project-oriented activities that build a wide variety of skills simultaneously, while freeing themselves to concentrate on curriculum development.

Students, too, are pushing the borders of the classroom with mobile computing:

- They have the freedom to access the Internet from their dorm rooms, the student union or from a park bench outside.
- They can conduct research, access study guides, plan and make presentations, and conduct online discussions outside the library and outside common classroom hours.
- They can even communicate with professors, get class notes, participate in class work and access worldwide databases anytime and anywhere they choose.

Perhaps best of all, since students are free from the confines of the computer lab, they are more excited, enthusiastic, and eager to learn; actually spending more time studying and in independent research.

Numerous top schools around the country—including Wake Forest University, University of North Carolina, Seton Hall University, Dartmouth College, Northwest Nazarene University, Morris-Brown College and Albertson College of Idaho—have already discovered that mobile computing can help them deliver a higher quality education while reducing the Total Cost of Ownership of their IT infrastructure.

*"[Notebook] computers can add tremendously to the learning that takes place in the classroom. And they can take learning and technology out of the classroom to their internships, their residence halls and their favorite spot under a tree."*

—Alan Brinton, Vice President for Academic Affairs, Albertson College of Idaho





*"With the wireless network and notebooks, we can become familiar with virtual communication and collaboration applications like NetMeeting.\* Then, when we graduate we'll have the skills we need for the business world."*

—Jamael Gardener, Senior, Business Administration, Morris-Brown College

## Prepare Students for the "Real World"

Today's students will live in a wireless world. So notebooks not only help them perform better in school, they also give them an edge for their future careers.

Seton Hall University notes that, "We have broken down the barriers of space and time to ensure that our students will have access to the tools and technology they need to be better students and professors. And we believe that technological competencies will make our students more competitive and successful future employees, regardless of the career choices they make." In addition, Steven House, a biology professor and Associate Dean of the College of Arts and Sciences at Seton Hall, found that with notebooks his students nearly doubled the time spent on learning.

Morris-Brown College found that their notebook/wireless program not only lets students access research sources from around the world anytime and anywhere, they also learn a host of skills in addition to the subject matter—technology skills, collaboration and presentation development, to name a few.

Studies have also found:

- Students who use notebooks are better able to apply active learning strategies and critical thinking skills.
- Students with notebooks show deeper, more flexible use of technology, perform better on writing assessments, and rate their computer confidence higher.
- Teachers in notebook environments report more frequent use of student-led inquiry and collaborative work.<sup>1</sup>

<sup>1</sup> <http://www.rockman.com/projects/laptop/>

# Help Teachers Make a Difference

## Inspire Students to Learn.

Mobile computing can help your faculty enhance learning opportunities and make lectures more interesting and vibrant. With notebooks, professors can:

- Introduce multimedia into lectures and research assignments.
- Discover how other institutions are teaching similar subject matter, and research potential class projects.
- Collaborate in real-time across campus and with other institutions, exchanging ideas and plans to make the learning experience fresh and exciting.
- Make classes more interactive, with students and professors communicating individually, in small groups, or with the entire class using electronic instructional communications.
- Enhance learning by sharing resources online, such as course syllabi, work assignments, quizzes, Internet links to course material, research assignments, lecture notes, reading materials and recorded media files.

Notebooks also help students make better use of their time by simplifying research and giving them instant access to the information they need anytime, anywhere.

## Discover Innovative New Ways to Teach.

One of the most exciting aspects of notebooks is their ability to introduce powerful new dimensions to traditional learning:

- Interact with peers on a team project or consult with experts overseas.
- Practice a foreign language by conversing over e-mail with people in another country.

- Conduct simulations, such as moving notes around on a staff to hear new chords, or watching the effects of weather change patterns in real-time on the screen.
- Take virtual field trips to places like the Antarctic, or inside the human body.
- Run virtual experiments instead of expensive, lengthy lab exercises.

For instance, at Eindhoven University, engineering teachers offer virtual experiments rather than running laboratory exercises that are expensive, time-consuming and potentially dangerous. With notebooks, engineering students can run several experiments, change parameters and obtain results in a week that would take months to accomplish in a laboratory.

## Enhance Efficiency and Interaction.

With notebooks, both faculty and students gain faster access to information so they can spend more time analyzing and discussing. For instance, some professors now use “smartboards”—similar to white boards but attached to a computer. Whatever they write on the smartboard can be loaded onto the faculty member’s Web site. Alan Krause, a senior majoring in computer science at Northwest Nazarene University, says, “It’s great because you can pull up the lessons just about anytime.” He adds that the technology is especially helpful to students who are not good at simultaneously listening and taking notes.

Professors can also post password-protected test results and grades online, providing faster feedback to students and streamlining paper processes.





*"The fact that students can now access their transcripts and grades online has saved me LOTS of time in my function as Registrar."*

*—Dr. Carolyn Jackson, Vice President, Academic Affairs, Morris-Brown College*

# Give Administrators the Tools to Build Your Reputation

Mobile computing gives administrators the tools they need to meet higher academic standards and manage their work and schedules more effectively. For the first time, administrative personnel can facilitate communication among all partners in the education process, bringing students, instructors, and when necessary, parents into virtual collaboration.

President Dr. Dolores Cross of Morris-Brown College believes mobile computing has given the college a substantial competitive advantage. "I think it's helped with the recruiting of students and faculty," she says. "I also think it's helped give students better opportunities after graduation because they can say they attended a college with a wireless environment that mandated student notebooks. Few colleges have that wireless environment. It's also helped us with fundraising because we can demonstrate to funders that we've invested in ourselves and that we're creating the kinds of programs that will really give students an opportunity to succeed."

## Reduce Costs and Streamline Processes.

Notebooks also streamline processes by giving all students access to online services that are costly to provide in person. Grades can be posted electronically on a secure site, eliminating the time and expense of mailing grades and sparing the Registrar hours of providing hard-copy transcripts. Students can even register for classes online.

## Help Your IT Department Help Students.

By establishing campus-wide standards for mobile computing technology, your school can ensure that all students have hardware and software that's compatible for use in and out of the classroom. This has numerous benefits, including making it possible for your IT department to offer student technology training and 24-hour support.



# The Mobile Intel® Pentium® 4 Processor - M: Powering Education

## The Ultimate in Portable Power.

The need for powerful, energy-efficient notebook computers in higher education is growing. While instructors and students today churn through data sets, crunch numbers in e-Learning modules, and create exciting content for research projects, reports and presentations, system diagnostics and virus scans must run seamlessly in the background. More sophisticated operating systems and office suites with intelligent interfaces and feature sets add to the processors load, making the need for high performance just as great for notebooks as for desktop systems. The Mobile Intel® Pentium® 4 Processor - M delivers that mobile performance.

Designed to provide the power required by next-generation platforms, the Mobile Intel Pentium 4 Processor - M delivers the flexibility, manageability, and longevity that colleges and universities need most.

## Designed for Mobile PCs.

The Mobile Intel Pentium 4 Processor - M is optimized to give educators what they want in full-size, thin-and-light notebooks... the highest performance Intel® mobile processor, extended battery life for greater mobility, and a small package designed to optimize performance and enable sleeker, easier-to-carry systems, and seamless connectivity.

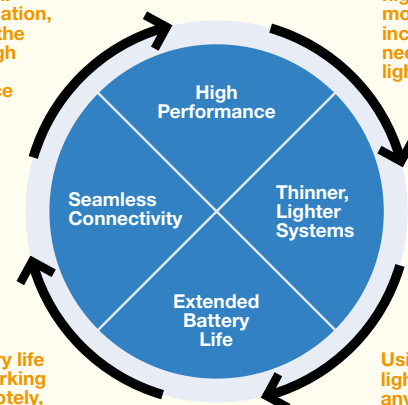
The Mobile Intel Pentium 4 Processor - M features a unique combination of innovative technologies that give you quicker access and response times anytime,

anywhere, including accelerated video, multimedia and 3D performance, faster peripheral performance and smoother multimedia performance. It also supports the latest connectivity and digital audio technology. And most of today's notebooks come wireless enabled or wireless ready to give you consistently outstanding performance across wired and wireless environments.

Of course, all the performance in the world won't help if your battery doesn't last. That's why the Mobile Intel Pentium 4 Processor - M is designed with advanced mobile power management features such as Enhanced Intel® SpeedStep® Technology and Deeper Sleep Alert State. With extended battery life, you get the freedom you need to work, surf the net, stay in touch with family, or collaborate with colleagues no matter how far you are from a power outlet.

Today's network bandwidth allows access to all your information, increasing the need for high processor performance

Maximizing productivity with high-performance mobile PCs increases the need for thinner, lighter systems



Long battery life enables working longer remotely, increasing the need for seamless wired and wireless network connectivity

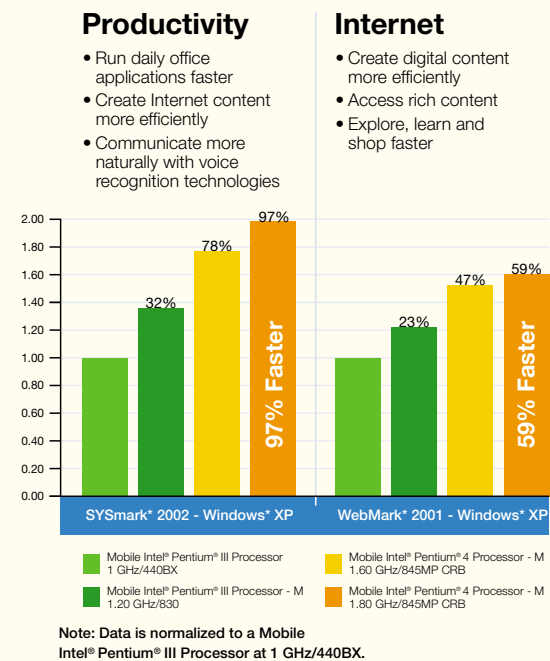
Using thin-and-light systems anywhere, anytime increases the need for extended battery life



## Processors Designed to Keep Your Classroom Humming

The Mobile Intel® Pentium® 4 Processor - M is designed to help you get the most out of mobile computing:

- Highest performance to handle everything from multimedia applications to the Internet.
- Extended battery life with Enhanced Intel® SpeedStep® and QuickStart Technology for fewer interruptions.
- Innovative system design for the most stylish and user-friendly systems.
- Wireless connectivity to give you consistently outstanding performance across wired and wireless environments.



## How Today's High-Performance Notebooks Enhance Education.

**Multimedia:** Student presentations now incorporate streaming video, high-performance 3-D graphics, and audio. Instead of reading a famous speech, students can hear the original words in the speaker's voice, while watching footage representing society at a precise moment in history.

**Video Editing and Encoding:** The ability to quickly create, edit, and share video has unleashed creativity and restored fine arts to the classroom. Instead of passively observing, student filmmakers are breathing new energy into the learning process overall.

**Multitasking:** Students can simultaneously take notes, go online for research, and engage in course-directed chat in a global classroom. New software developed specifically for schools allows immediate communication between teachers, students, parents, and administrators, 24 hours a day.

**Content Creation:** Professors and instructors want the tools to quickly develop captivating presentations and classroom material. Students need the ability to build documents and projects with the professional look of desktop publishing at a quality level not seen in the past. From mathematical modeling to 3D and CAD/CAM rendering, today's notebooks have what it takes.

**Internet:** Web pages aren't just text anymore—they stream entertainment, push information, create excitement, and draw readers in. Today's high-powered mobile processors bring to life the

world's most important sites and provide the portable power for students, professors and administrators to collect and disseminate the information they need effectively.

**Office Productivity:** Like big corporations with large IT departments, colleges and universities are expected to be even more efficient with even fewer personnel. High-performance notebooks can help streamline administrative and communication functions in an environment where multitasking is now the norm.

**Communication & Collaboration:** College-to-college, department-to-department, student-to-student, administrative and networking activities are becoming more prevalent. The virtual parent-teacher conference keeps parents actively engaged in the education process. The virtual conference also keeps student project teams, intra- and interdisciplinary faculty and other groups engaged. Today's high-powered notebooks also enable real-time object sharing and joint development, so students can participate in inter-district student projects that enhance creativity and collaboration through team building.

**Gaming:** When study, research, assignments and work are done, students are ready to play, and high-performance notebooks deliver the performance PC gamers relish.

# Get a Better Return on Investment

Return on Investment (ROI) is the key decision driver for most higher education institutions, and IT investments are no exception. As higher education institutions are recognizing the benefits of mobile computing and the strong ROI it delivers, their administration and IT departments are investing in notebook computers for their students, faculty and administration.

## Give Your School a Competitive Edge.

Mobile computing can help you improve learning and retention, reduce costs, and position students and your institution to succeed in a wireless world. For more information on how you can help your students, faculty and administration reach their full potential, visit:

[www.intel.com/eBusiness/education/index.htm](http://www.intel.com/eBusiness/education/index.htm).

### Increase Your Total Benefit of Ownership:

- Improve productivity
- Improve student, faculty and administration satisfaction

### Reduce Your Total Cost of Ownership:

- Lower hardware and software costs
- Lower support costs and minimized downtime with more reliable operating systems

*"Kellogg looks at it from a holistic perspective, not just based on costs. We think that there are significant benefits associated with wireless for Kellogg and that these benefits greatly outweigh the incremental costs associated with deploying wireless."*

—Catherine Grimsted, Associate Dean of Finance, Technology and Planning, Kellogg School of Management

*"Having seen the advantages that have come with our wireless connectivity, I think it's easy to see that the benefits far outweigh the costs associated with it."*

—Pious Mgabe, Senior, Computer Science, Morris-Brown College

# Additional Resources

---

## Intel® “Teach to the Future” Program

Intel’s “Teach to the Future” teacher training program is designed to promote inquiry-based learning, and to effectively integrate computers into your existing curriculum to increase student learning and achievement. This program will instruct 400,000 teachers over three years in the effective use of computer technology in the classroom. For more information on how you can participate, visit [www.intel.com/education/teach/index.htm](http://www.intel.com/education/teach/index.htm).

## Intel’s Managing Technology Resources

School IT departments need all the help they can get. That’s why we’ve put together an entire Web site designed to help you better integrate and manage technology in your school. You’ll find troubleshooting tips, help with systems management, and even information on recycling and donating computers when you’re through with them.

Visit [www.intel.com/education/managing/index.htm](http://www.intel.com/education/managing/index.htm).

# Put the Benefits of Intel® Mobile Computing to Work in Your School

For information about Intel® programs in education, visit

[www.intel.com/eBusiness/education/index.htm](http://www.intel.com/eBusiness/education/index.htm).

For information about the Mobile Intel® Pentium® 4 Processor - M, visit

[www.intel.com/design/mobile/pentium4p-m/p4p-m.htm](http://www.intel.com/design/mobile/pentium4p-m/p4p-m.htm).

Intel Corporation  
2200 Mission College Boulevard  
P.O. Box 58119  
Santa Clara, CA 95052-8119



\* Other names and brands may be claimed as the property of others.

Copyright © 2002, Intel Corporation. All rights reserved.

Intel, Pentium and SpeedStep are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

0402/OC/RC/PP/20K

Order Number: 250965-001